

The Metob Group

With its cathodic dip and powder coatings as well as pickling passivation, the Metob group is one of the most efficient and versatile surface finishers in Germany. At the sites in Michelau (Upper Franconia) and Hildburghausen (Thuringia), on a production area of around 20,000 m², more than 250 people are working on high quality surfaces.

At Metob, in-house developments, state-of-the-art plant technology and efficient logistics are always geared to sustainability and resource efficiency, because environmentally friendly practices are a key element of the corporate policy.

Coatings from the Metob group are twofold sustainable

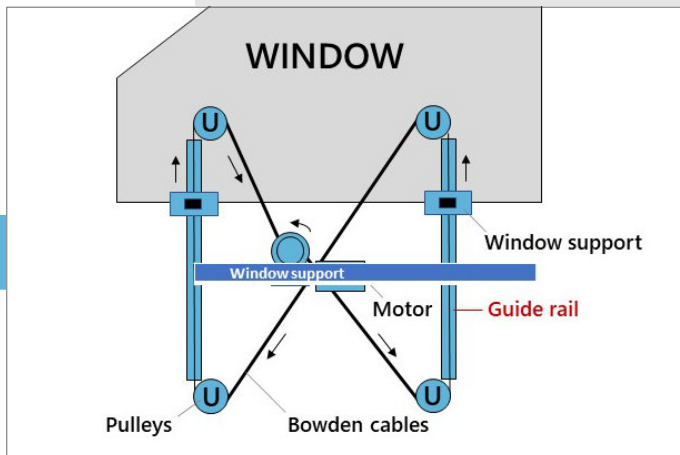
Accurate, double-sided coatings are function-relevant for window lifter guide rails

In Upper Franconia, the Metob Group coats a large number of guide rails for car windows every day. If too little powder is applied, corrosion protection will not be sufficient. If the coating thickness is exceeded on one side of the guide rail, the window lifter will jam later. The coating thickness is therefore a functionally relevant parameter.

We visited the Metob group and talked to Managing Director Marco Jobst and Quality Manager Martin Kolenda about the demanding challenges of coatings for the automotive industry.

Success story Metob group

The window lifter of a car lowers the window panes into the car door. Therefore the window support slides along guide rails, which are coated by Metob on both sides within functionally safe margins.



A relic from Metob's early days: the hand-held powder coater from the 1970s. At that time, one could only dream of today's coating efficiency, with powder losses minimized to only 4% thanks to intelligent recovery technology.



Employees as a key to success

When asked what makes the Metob group so unique, Marco Jobst answers immediately "our staff". The coating technology process mechanics are true specialists and many of them have been educated here, the Managing Director continues.

At Metob today, many positions in quality management and production are filled by former, in-house apprentices. This is thanks to Martin Kolenda, the long-standing Quality and Training Manager, who, as a master mechanic and environmental technician in process engineering, can pass on a great deal of know-how to the apprentices. In this way, they can learn hands-on how to tune the plant parameters for a perfect surface.

In four powder coating and three cathodic dip coating lines, as well as in the plant for washing, pickling and preserving this kind of knowledge, combined with many years of experience, is a valuable competitive factor that should not be underestimated.

Eight lines for a wide range of coating tasks

In powder coating technology alone, the range of Metob equipment extends from a small manual coating line through automatic booths for series production

to a fully automatic, complex coating system with a large pretreatment stage. In this way, each individual order can be produced in a highly economical and sustainable manner.

The customers are mainly from the automotive sector as well as furniture and stroller manufacturers. On automatic powder plant "Number 4", passenger car window lifter guide rails for automotive customers are coated on both sides every day.

The efficient journey of parts through the coating line

After guide rails have been received and collected, the substrates embark on a journey of a good 200 meters length through the recirculating conveyor system. For this purpose, production employees attach parts to specially developed coating trays.

Now the parts travel upwards. There, grease and dirt are removed and the parts are coated with a conversion layer that serves as corrosion protection and bonding agent. After pretreatment, the guide rails are rinsed and dried to achieve optimum surface cleanliness. Now the conveyor belt moves substrates to the heart of the powder application system, the coating unit, where the fully automated powder application takes place. Coating guns apply powder to

both sides of the part; coating the A side of the guide rail separately from the B side.

An intelligent gap control detects the beginning and end of the trays. In these part-free gaps, coating guns are switched off automatically to save powder. Any excess powder is recycled and returned to the coating process.

Major challenge in coating process

The main challenge in this automated coating process is the rear, averted area of the guide rail. Here, it is important to achieve a coating thickness as close as possible to the front side of the part.

Martin Kolenda explains the task in detail: "The guide rails are very small, complex parts with a wide variety of geometries. Furthermore, we have upper and lower limits of the coating thickness. The tolerance range of 40 to 120 µm looks quite comfortable at first glance, but the devil is in the details. The coating must have approximately the same thickness on the front and back of the guide rails."

If too much powder is applied to the guide rails and the coating thickness exceeds the tolerance band, the car windows will later jam when opened. "The actuator can no longer move the window pane upwards. And in the worst case,

“With the new measurement technology, we can now measure in areas where we got no reasonable results with conventional equipment. Even on edges and creases.”

Martin Kolenda

Environmental technician in process engineering, training and quality manager, Metob group



The PaintChecker mobile family

Compact controller and ultra-light sensor

The complete measuring system consists of two units: The controller with the evaluation electronics and the lightweight, compact sensor as the actual measuring device. The tiny dimensions of the smallest sensor of 130 × 25 mm with a weight of just 50 g enable measurements in places that were previously difficult to access.

The right sensor for every task

The mobile OptiSense laser models are mainly used for smooth coatings on metallic substrates. Due to their tiny measuring spot, the slim laser sensors are particularly suitable for coating thickness tests on delicate small parts, corners and edges.

Due to the larger measuring spot, LED sensors are ideal for freehand measurements on rough surfaces. The PaintChecker mobile Gun-R model is particularly suitable for components made of plastic or rubber.

The PaintChecker mobile Gun-B is optimized for non-parts contacting tests of freshly applied powder coatings before baking. It measures the still soft powder coating on substrates such as metal, glass or plastic, independent of color and type. The shrinkage during the baking process is taken into account.

the electric motor of the window lifter breaks down because it simply takes too much force to move the jammed window”, Mr. Kolenda explains.

But that’s not enough of a challenge: Metob coats many different pairs of rails, which also have completely different geometries. In addition, variable external factors such as humidity or temperature also affect the coating.

In order to compensate for these adverse external conditions, parameters of the coating system can be adjusted, but nevertheless the coating of the guide rails remains an extremely delicate process.

The line is coating a huge number of such guides per day. With former test equipment, coating thickness could only be measured after baking, i.e. very late in the process.

Jobst explains: “If it then turned out that the coating thickness was not correct, all parts on the conveyor behind the application booth were scrap because the parameters set in the line apply to the complete batch. A large amount of parts would be miscoated and would have to be disposed of at high cost”.

In order to optimize process settings and control, Metob group now relies on

Success story Metob group

Metob coating processes have become significantly more stable thanks to the PaintChecker Mobile



Front and back of the window lifter guide rails hardly differ in their coating thickness anymore



coating thickness measurement even before the powder coating is baked.

The Metob Managing Director became aware of in-process coating thickness measurement when reading an OptiSense success story in a trade journal. "Non-contacting measurement prior to baking sounded very exciting", Jobst remembered, "I just gave OptiSense a call".

PaintChecker successfully passes trial period

OptiSense Sales manager Sascha Schmidt presented the PaintChecker Mobile coating thickness measurement system right away. Metob employees put the handheld measuring device through its paces for a quarter of a year during ongoing operation, comparing the results with those of the contacting instruments after baking. "Ultimately, we wanted to know: Is the plant economically adjusted? Because this is the only way we can avoid complaints and incorrect coatings", explains Head of Quality assurance Kolenda.

Of course, Metob also looked at other vendors of non-contacting measurement equipment. "These devices certainly have their applications – but for us they were not very suitable. The measuring spot was too large and thus the measured values were not as accurate as expected.

That's why we selected the OptiSense PaintChecker Mobile", says Kolenda. The company at first ordered two of the portable measuring devices.

„I can measure coating thickness really easy and on the spot with the Paint Checker Mobile – without complex training.“

Marco Jobst

Managing Director, Metob Group

Early measurement avoids miscoating

Now a coater from the production team checks the coating thickness directly behind the coating booth, when powder coating has not yet been baked. If the coating is out of tolerance, he can react much faster and correct the plant settings accordingly.

Each guide rail is tested at six critical locations, which are marked accordingly. For this purpose, an employee removes the rail from production process. The coating thickness is measured at each location and documented in order to finally compare target and actual values. Final results are then recorded and archived.

Control measurements of coating thickness are taken every 15 minutes. Metob relies on extremely intensive testing during series production, in which coating thickness and gloss level are measured and adhesion tests (cross-cut) are carried out in closely timed intervals.

"We're being challenged a lot these days in terms of verifications. This is due to the special requirements of each order. Depending on the customer, there is a whole range of checks, such as tensile shear and arc testing, as well as peel and corrosion behavior. We conduct all these tests in-house and finally archive test reports. In addition, we store samples for possible later evaluation. A gapless documentation is an absolute necessity today", explains Jobst.

Reliable processes due to intense, in-series testing

"Since we started using the PaintChecker Mobile, our processes have become much more stable", says Martin Kolenda, "previously, we could only measure the coating thickness after baking. Now, with non-contact testing before baking, the process fluctuations are significantly lower.

Meanwhile, the tolerance band of the coating thickness could be harmonized. And the leveling of the front and rear side coating thickness has also been



achieved. Values differ only by a few μm and there are hardly any outliers. The process runs more smoothly and better.”

The new test procedure pays off

Metob writes sustainable production in big green letters – not only when it comes to solvent-free coatings. After all, Metob runs an energy-intensive business consuming about 4 million kWh of electricity and 14 million kWh of natural gas per year.

Metob has long since achieved the energy turnaround: A combined heat and power plant was commissioned in 2016. In 2020, a photovoltaic system went into operation, which is currently being expanded and is already making a significant contribution to reducing CO₂ emissions. Since 2020, the company has been sourcing its electrical power entirely from renewable energies. In 2021, an environmental offsetting project for natural gas has been initiated.

“In Scope 2, i.e. indirect emissions from purchased energy, we are already climate neutral by using only green electricity”, explains Marco Jobst. Meanwhile, Metob group has appointed an energy consultant to conduct an audit on further savings potential.

When it comes to its suppliers, Metob

also prefers environmentally friendly solutions from sustainable partners.

“With our new coating thickness meter, we know much earlier whether our coating is ok or not. And every part that we do not have to dispose of means less plant wear, energy consumption, resource use and material loss. So with the PaintChecker Mobile, we save raw materials and energy at the same time.”

By the way, Metob has since purchased two more PaintChecker Mobile for the plant in Hildburghausen (Thuringia). Thanks to OptiSense, the bottom line is now a fourfold optimization in terms of resource efficiency.

„The PaintChecker improves process stability, reduces waste and saves us a lot of resources.“

Martin Kolenda

Environmental technician in process engineering, training and quality manager, Metob group

At the Michelau site, a new roof connects the Metob production building with a warehouse for raw and finished parts, which can now be transported and commissioned regardless of the weather.



OptiSense GmbH & Co. KG
Annabergstraße 120
45721 Haltern am See
GERMANY
Tel. +49 23 64 50 882-0
info@optisense.com
www.optisense.com